Thermo Nutech
W.O. No. N9-03-023-7094

Bechtel Hanford Inc.
SDG H0350

Case Narrative

1.0   GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0350 is comprised of ten solid (other solid) samples designated under SAF No. B99-021 with a Project Designation of: 109-N Roof Sampling.

Due to the nature of the samples (roof material) all aliquots were reduced for easier sample preparation.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist.

2.0   ANALYSIS NOTES

2.1   Total Strontium Analyses

All MDA's were greater than the RDL due to the significantly reduced sample aliquots.

2.2   Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.3   Isotopic Plutonium Analyses

All MDA's were greater than the RDL due to the significantly reduced sample aliquots.

2.4   Gamma Scan Analyses

All MDA's were greater than the RDL due to the significantly reduced sample aliquots. Positive Co60 was detected in samples B0V0K3, B0V0K4, and B0V0K5.
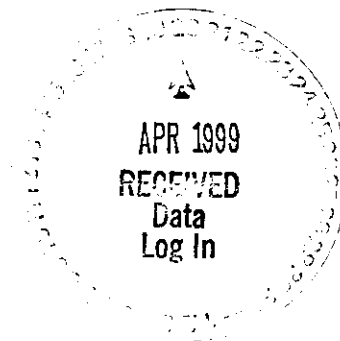
APR 1999
RECEIVED
Data
Log In

SAMPLE SUMMARY

SDG 7094	
Contact L.A. Johnson	

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG-H0350	

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V0K3	100N	SOLID		N903023-01	B99-021	B99-021-04	03/05/99 09:32
B0V0K4	100N	SOLID		N903023-02	B99-021	B99-021-04	03/05/99 09:50
B0V0K5	100N	SOLID		N903023-03	B99-021	B99-021-04	03/05/99 10:00
B0V0K6	100N	SOLID		N903023-04	B99-021	B99-021-04	03/05/99 10:15
B0V0K7	100N	SOLID		N903023-05	B99-021	B99-021-04	03/05/99 10:35
B0V0K8	100N	SOLID		N903023-06	B99-021	B99-021-04	03/05/99 10:40
B0V0K9	100N	SOLID		N903023-07	B99-021	B99-021-04	03/05/99 11:00
Method Blank		SOLID		N903023-09	B99-021		
Lab Control Sample		SOLID		N903023-08	B99-021		
Duplicate (N903023-01)	100N	SOLID		N903023-10	B99-021		03/05/99 09:32

SAMPLE SUMMARY

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Lab id TMANC	
Protocol Hanford	
Version Ver 1.0	
Form DVD-CS	
Version 3.06	
Report date 04/06/99	

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0350

QC SUMMARY

SDG 7094
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0350

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS RECEIVED	SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7094	B99-021-04	B0V0K3	SOLID	100.0			03/06/99	1	N903023-01	7094-001
		B0V0K4	SOLID	100.0			03/06/99	1	N903023-02	7094-002
		B0V0K5	SOLID	100.0			03/06/99	1	N903023-03	7094-003
		B0V0K6	SOLID	100.0		.	03/06/99	1	N903023-04	7094-004
		B0V0K7	SOLID	100.0			03/06/99	1	N903023-05	7094-005
		B0V0K8	SOLID	100.0			03/06/99	1	N903023-06	7094-006
		B0V0K9	SOLID	100.0			03/06/99	1	N903023-07	7094-007
		Method Blank	SOLID						N903023-09	7094-009
		Lab Control Sample	SOLID						N903023-08	7094-008
		Duplicate (N903023-01)	SOLID	100.0			03/06/99	1	N903023-10	7094-010

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 04/06/99

SAMPLE DELIVERY GROUP H0350

PREP BATCH SUMMARY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0350

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED						QUALI-FIERS
					CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	
Alpha Spectroscopy												
PU	SOLID	Plutonium, Isotopic in Solids	2857-175	5.0	7			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	2857-175	5.0	7		.	1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	2857-175	10.0	7			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	2857-175	15.0	7			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-PBS

Version 3.06

Report date 04/06/99

SDG 7094
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0350

CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
B0V0K3			N903023-01	7094-001	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-001	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-001	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-001	U		03/12/99	.03/15/99	NJV	Uranium, Isotopic in Soil
B0V0K4			N903023-02	7094-002	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-002	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-002	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-002	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil
B0V0K5			N903023-03	7094-003	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-003	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-003	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-003	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil
B0V0K6			N903023-04	7094-004	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-004	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-004	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-004	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil
B0V0K7			N903023-05	7094-005	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-005	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-005	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-005	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil
B0V0K8			N903023-06	7094-006	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-006	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-006	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-006	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil
B0V0K9			N903023-07	7094-007	GAM		03/10/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-007	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
B99-021-04	B99-021		03/06/99	7094-007	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-007	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil
Method Blank			N903023-09	7094-009	GAM		03/09/99	03/10/99	DER	Gamma Scan
		SOLID		7094-009	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
	B99-021			7094-009	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-009	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 04/06/99

WORK SUMMARY, cont.

SDG 7094
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0350

CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N903023-08	7094-008	GAM		03/09/99	03/10/99	DER	Gamma Scan
		SOLID		7094-008	PU	.	03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
	B99-021			7094-008	SR		03/16/99	04/06/99	NJV	Total Strontium in Soil
				7094-008	U		03/12/99	.03/15/99	NJV	Uranium, Isotopic in Soil
Duplicate (N903023-01)			N903023-10	7094-010	GAM		03/09/99	03/10/99	DER	Gamma Scan
100N		SOLID	03/05/99	7094-010	PU		03/12/99	03/15/99	NJV	Plutonium, Isotopic in Solids
	B99-021		03/06/99	7094-010	SR		03/11/99	03/15/99	NJV	Total Strontium in Soil
				7094-010	U		03/12/99	03/15/99	NJV	Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	B99-021	Gamma Scan	GAMMAHI	7			1	1	1		10
PU	B99-021	Plutonium, Isotopic in Solids	PUPLATE	7			1	1	1		10
SR	B99-021	Total Strontium in Soil		7			1	1	1		10
U	B99-021	Uranium, Isotopic in Soil	UPLATE	7			1	1	1		10
TOTALS				28			4	4	4		40

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 04/06/99

N903023-09		Method Blank

M E T H O D   B L A N K

SDG <u>7094</u>
Contact <u>L.A. Johnson</u>

Client/Case no <u>Hanford</u> <u>SDG-H0350</u>
Case no <u>TRB-SBB-207925</u>

Lab sample id <u>N903023-09</u>
Dept sample id <u>7094-009</u>

Client sample id <u>Method Blank</u>
Material/Matrix _____ <u>SOLID</u>
SAF No <u>B99-021</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.030	0.040	0.077	0.30	U	U
Uranium 235	15117-96-1	0.024	0.024	0.093	0.30	U	U
Uranium 238	U-238	0	0.020	0.077	0.30	U	U
Plutonium 238	13981-16-3	0.027	0.028	0.050	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.018	0.050	0.050	U	PU
Total Strontium	SR-RAD	0.005	0.23	0.31	1.0	U	SR
Potassium 40	13966-00-2	U		0.19		U	GAM
Cobalt 60	10198-40-0	U		0.014	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.050	U	GAM
Europium 152	14683-23-9	U		0.032	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.021	0.10	U	GAM
Americium 241	14596-10-2	U		0.009		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Uranium 235	15117-96-1	U		0.038		U	GAM

109-N Roof Sampling

QC-BLANK 30265

Lab id	<u>TMANC</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>3.06</u>
Report date	<u>04/06/99</u>

METHOD BLANKS
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N903023-08		Lab Control Sample

LAB CONTROL SAMPLE

SDG 7094

Contact L.A. Johnson

Lab sample id N903023-08

Dept sample id 7094-008

Client/Case no Hanford_____ SDG-H0350___

Case no TRB-SBB-207925___

Client sample id Lab Control Sample_____

Material/Matrix _____ SOLID___

SAF No B99-021___

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	4.91	0.82	0.40	0.30		U	5.14	0.21	96	74-126	80-120
Uranium 235	3.90	0.70	0.15	0.30		U	4.20	0.17	93	73-127	80-120
Uranium 238	5.31	0.86	0.38	0.30		U	5.29	0.21	100	74-126	80-120
Plutonium 238	5.21	0.57	0.044	0.050		PU	5.67	0.23	92	82-118	80-120
Plutonium 239/240	4.92	0.54	0.038	0.050		PU	5.29	0.21	93	82-118	80-120
Total Strontium	10.9	0.54	0.26	1.0		SR	10.3	0.41	106	81-119	
Cobalt 60	0.299	0.011	0.005	0.050		GAM	0.309	0.012	97	77-123	80-120
Cesium 137	0.328	0.010	0.006	0.050		GAM	0.348	0.014	94	78-122	80-120

109-N Roof Sampling

QC-LCS 30264

LAB CONTROL SAMPLES

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Lab id TMANC___

Protocol Hanford___

Version Ver 1.0___

Form DVD-LCS___

Version 3.06___

Report date 04/06/99___

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0350

DUPLICATE

SDG 7094		Client/Case no Hanford SDG-H0350
Contact L.A. Johnson		Case no TRB-SBB-207925
DUPLICATE	ORIGINAL	
Lab sample id N903023-10	Lab sample id N903023-01	Client sample id B0V0K3
Dept sample id 7094-010	Dept sample id 7094-001	Location/Matrix 100N SOLID
	Received 03/06/99	Collected 03/05/99 09:32
% solids 100.0	% solids 100.0	Custody/SAF No B99-021-04 B99-021

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Uranium 233/234	0.029	0.029	0.11	0.30	U	U	0.026	0.026	0.10	U	-		
Uranium 235	0	0.035	0.13	0.30	U	U	0	0.032	0.12	U	-		
Uranium 238	0.029	0.029	0.11	0.30	U	U	0.039	0.053	0.10	U	-		
Plutonium 238	0	0.13	0.35	0.050	U	PU	-0.025	0.049	0.19	U	-		
Plutonium 239/240	0.096	0.13	0.25	0.050	U	PU	0	0.099	0.24	U	-		
Total Strontium	0.820	2.4	3.2	1.0	U	SR	-0.022	2.7	3.5	U	-		
Potassium 40	U		13		U	GAM	U		20	U	-		
Cobalt 60	1.84	0.92	0.83	0.050		GAM	4.36	2.1	1.5		81	116	
Cesium 137	U		0.77	0.050	U	GAM	U		1.6	U	-		
Europium 152	U		1.8	0.10	U	GAM	U		3.4	U	-		
Europium 154	U		1.9	0.10	U	GAM	U		5.4	U	-		
Europium 155	U		1.6	0.10	U	GAM	U		2.0	U	-		
Americium 241	U		1.6		U	GAM	U		1.0	U	-		
Uranium 238	U		94		U	GAM	U		210	U	-		
Uranium 235	U		2.7		U	GAM	U		3.4	U	-		

109-N Roof Sampling

QC-DUP#1 30266

DUPLICATES
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Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/06/99

SDG <u>7094</u>   Client/Case no <u>Hanford</u>   <u>SDG-H0350</u>

Contact <u>L.A. Johnson</u>   Case no <u>TRB-SBB-207925</u>

Lab sample id <u>N903023-01</u>   Client sample id <u>B0V0K3</u>

Dept sample id <u>7094-001</u>   Location/Matrix <u>100N</u>   <u>SOLID</u>

Received <u>03/06/99</u>   Collected <u>03/05/99 09:32</u>

% solids <u>100.0</u>   Custody/SAF No <u>B99-021-04</u>   <u>B99-021</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.026	0.026	0.10	0.30	U	U
Uranium 235	15117-96-1	0	0.032	0.12	0.30	U	U
Uranium 238	U-238	0.039	0.053	0.10	0.30	U	U
Plutonium 238	13981-16-3	-0.025	0.049	0.19	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.099	0.24	0.050	U	PU
Total Strontium	SR-RAD	-0.022	2.7	3.5	1.0	U	SR
Potassium 40	13966-00-2	U		20		U	GAM
Cobalt 60	10198-40-0	4.36	2.1	1.5	0.050		GAM
Cesium 137	10045-97-3	U		1.6	0.050	U	GAM
Europium 152	14683-23-9	U		3.4	0.10	U	GAM
Europium 154	15585-10-1	U		5.4	0.10	U	GAM
Europium 155	14391-16-3	U		2.0	0.10	U	GAM
Americium 241	14596-10-2	U		1.0		U	GAM
Uranium 238	U-238	U		210		U	GAM
Uranium 235	15117-96-1	U		3.4		U	GAM

109-N Roof Sampling

Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-DS</u>

Version <u>3.06</u>

Report date <u>04/06/99</u>

T M A / R I C H M O N D

SAMPLE DELIVERY GROUP H0350

D A T A   S H E E T

SDG 7094	Client/Case no Hanford ___ SDG-H0350
Contact L.A. Johnson	Case no TRB-SBB-207925
Lab sample id N903023-02	Client sample id B0V0K4
Dept sample id 7094-002	Location/Matrix 100N ___ SOLID
Received 03/06/99	Collected 03/05/99 09:50
% solids 100.0	Custody/SAF No B99-021-04 ___ B99-021

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.397	0.14	0.11	0.30		U
Uranium 235	15117-96-1	0.017	0.034	0.13	0.30	U	U
Uranium 238	U-238	0.552	0.18	0.11	0.30		U
Plutonium 238	13981-16-3	0.028	0.11	0.26	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.055	0.11	0.31	0.050	U	PU
Total Strontium	SR-RAD	-0.028	3.2	4.3	1.0	U	SR
Potassium 40	13966-00-2	U		15		U	GAM
Cobalt 60	10198-40-0	10.1	1.2	0.41	0.050		GAM
Cesium 137	10045-97-3	U		0.94	0.050	U	GAM
Europium 152	14683-23-9	U		1.8	0.10	U	GAM
Europium 154	15585-10-1	U		2.1	0.10	U	GAM
Europium 155	14391-16-3	U		1.5	0.10	U	GAM
Americium 241	14596-10-2	U		1.5		U	GAM
Uranium 238	U-238	U		110		U	GAM
Uranium 235	15117-96-1	U		2.4		U	GAM

109-N Roof Sampling

DATA SHEETS
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Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/06/99

N903023-03

B0V0K5

D A T A   S H E E T

SDG <u>7094</u>   Client/Case no <u>Hanford</u>   <u>SDG-H0350</u>
Contact <u>L.A. Johnson</u>   Case no <u>TRB-SBB-207925</u>

Lab sample id <u>N903023-03</u>   Client sample id <u>B0V0K5</u>
Dept sample id <u>7094-003</u>   Location/Matrix <u>100N</u>   <u>SOLID</u>
Received <u>03/06/99</u>   Collected <u>03/05/99 10:00</u>
% solids <u>100.0</u>   Custody/SAF No <u>B99-021-04</u>   <u>B99-021</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.029	0.029	0.11	0.30	U	U
Uranium 235	15117-96-1	0.017	0.035	0.13	0.30	U	U
Uranium 238	U-238	0.014	0.029	0.11	0.30	U	U
Plutonium 238	13981-16-3	-0.055	0.056	0.27	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.055	0.21	0.050	U	PU
Total Strontium	SR-RAD	-1.95	3.0	4.3	1.0	U	SR
Potassium 40	13966-00-2	U		8.1		U	GAM
Cobalt 60	10198-40-0	7.92	1.1	0.84	0.050		GAM
Cesium 137	10045-97-3	U		0.62	0.050	U	GAM
Europium 152	14683-23-9	U		1.5	0.10	U	GAM
Europium 154	15585-10-1	U		1.9	0.10	U	GAM
Europium 155	14391-16-3	U		1.3	0.10	U	GAM
Americium 241	14596-10-2	U		1.3		U	GAM
Uranium 238	U-238	U		79		U	GAM
Uranium 235	15117-96-1	U		2.1		U	GAM

109-N Roof Sampling

DATA SHEETS
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SUMMARY DATA SECTION
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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/06/99</u>

SDG <u>7094</u>   Client/Case no <u>Hanford</u>   <u>SDG-H0350</u>
Contact <u>L.A. Johnson</u>   Case no <u>TRB-SBB-207925</u>

Lab sample id <u>N903023-04</u>   Client sample id <u>BOVOK6</u>
Dept sample id <u>7094-004</u>   Location/Matrix <u>100N</u>   <u>SOLID</u>
Received <u>03/06/99</u>   Collected <u>03/05/99 10:15</u>
% solids <u>100.0</u>   Custody/SAF No <u>B99-021-04</u>   <u>B99-021</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.031	0.031	0.12	0.30	U	U
Uranium 235	15117-96-1	0.019	0.038	0.14	0.30	U	U
Uranium 238	U-238	0.031	0.031	0.12	0.30	U	U
Plutonium 238	13981-16-3	-0.079	0.080	0.38	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.040	0.079	0.30	0.050	U	PU
Total Strontium	SR-RAD	-0.275	2.7	3.5	1.0	U	SR
Potassium 40	13966-00-2	U		10		U	GAM
Cobalt 60	10198-40-0	U		0.56	0.050	U	GAM
Cesium 137	10045-97-3	U		0.41	0.050	U	GAM
Europium 152	14683-23-9	U		0.92	0.10	U	GAM
Europium 154	15585-10-1	U		1.4	0.10	U	GAM
Europium 155	14391-16-3	U		0.50	0.10	U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM
Uranium 238	U-238	U		52		U	GAM
Uranium 235	15117-96-1	U		0.85		U	GAM

109-N Roof Sampling

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/06/99</u>

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0350

D A T A   S H E E T

SDG 7094   Client/Case no Hanford   SDG-H0350
Contact L.A. Johnson   Case no TRB-SBB-207925

Lab sample id N903023-05   Client sample id B0V0K7
Dept sample id 7094-005   Location/Matrix 100N   SOLID
Received 03/06/99   Collected 03/05/99 10:35
% solids 100.0   Custody/SAF No B99-021-04   B99-021

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.127	0.085	0.11	0.30	J	U
Uranium 235	15117-96-1	0	0.034	0.13	0.30	U	U
Uranium 238	U-238	0.071	0.057	0.11	0.30	U	U
Plutonium 238	13981-16-3	0.059	0.18	0.34	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.088	0.21	0.050	U	PU
Total Strontium	SR-RAD	-1.09	2.3	3.2	1.0	U	SR
Potassium 40	13966-00-2	U		11		U	GAM
Cobalt 60	10198-40-0	U		0.79	0.050	U	GAM
Cesium 137	10045-97-3	U		0.56	0.050	U	GAM
Europium 152	14683-23-9	U		1.3	0.10	U	GAM
Europium 154	15585-10-1	U		1.3	0.10	U	GAM
Europium 155	14391-16-3	U		1.0	0.10	U	GAM
Americium 241	14596-10-2	U		1.1		U	GAM
Uranium 238	U-238	U		54		U	GAM
Uranium 235	15117-96-1	U		1.7		U	GAM

109-N Roof Sampling

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 04/06/99

T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0350

D A T A   S H E E T

B0V0K8

SDG 7094	Client/Case no Hanford		SDG-H0350
Contact L.A. Johnson	Case no TRB-SBB-207925		
Lab sample id N903023-06	Client sample id B0V0K8		
Dept sample id 7094-006	Location/Matrix 100N		SOLID
Received 03/06/99	Collected 03/05/99 10:40		
% solids 100.0	Custody/SAF No B99-021-04	B99-021	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.125	0.11	0.13	0.30	U	U
Uranium 235	15117-96-1	0.034	0.034	0.13	0.30	U	U
Uranium 238	U-238	0.042	0.056	0.11	0.30	U	U
Plutonium 238	13981-16-3	0	0.12	0.30	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.062	0.24	0.050	U	PU
Total Strontium	SR-RAD	-2.68	3.3	4.5	1.0	U	SR
Potassium 40	13966-00-2	U		2.9		U	GAM
Cobalt 60	10198-40-0	U		0.28	0.050	U	GAM
Cesium 137	10045-97-3	U		0.23	0.050	U	GAM
Europium 152	14683-23-9	U		0.55	0.10	U	GAM
Europium 154	15585-10-1	U		0.63	0.10	U	GAM
Europium 155	14391-16-3	U		0.45	0.10	U	GAM
Americium 241	14596-10-2	U		0.43		U	GAM
Uranium 238	U-238	U		26		U	GAM
Uranium 235	15117-96-1	U		0.70		U	GAM

109-N Roof Sampling

DATA SHEETS	Lab id TMANC
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	Report date 04/06/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0350

B0V0K9

DATA SHEET

SDG <u>7094</u>   Client/Case no <u>Hanford</u>   <u>SDG-H0350</u>
Contact <u>L.A. Johnson</u>   Case no <u>TRB-SBB-207925</u>

Lab sample id <u>N903023-07</u>   Client sample id <u>B0V0K9</u>
Dept sample id <u>7094-007</u>   Location/Matrix <u>100N</u>   <u>SOLID</u>
Received <u>03/06/99</u>   Collected <u>03/05/99 11:00</u>
% solids <u>100.0</u>   Custody/SAF No <u>B99-021-04</u>   <u>B99-021</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.046	0.061	0.12	0.30	U	U
Uranium 235	15117-96-1	0	0.037	0.14	0.30	U	U
Uranium 238	U-238	0.106	0.091	0.12	0.30	U	U
Plutonium 238	13981-16-3	-0.070	0.070	0.33	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.070	0.27	0.050	U	PU
Total Strontium	SR-RAD	-1.50	3.0	4.2	1.0	U	SR
Potassium 40	13966-00-2	U		7.2		U	GAM
Cobalt 60	10198-40-0	U		0.17	0.050	U	GAM
Cesium 137	10045-97-3	U		0.16	0.050	U	GAM
Europium 152	14683-23-9	U		0.39	0.10	U	GAM
Europium 154	15585-10-1	U		0.50	0.10	U	GAM
Europium 155	14391-16-3	U		0.34	0.10	U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM
Uranium 238	U-238	U		16		U	GAM
Uranium 235	15117-96-1	U		0.51		U	GAM

109-N Roof Sampling

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/06/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0350

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 2857-175								
B0V0K3	N903023-01			7094-001	U		U	
B0V0K4	N903023-02			7094-002	U		U	
B0V0K5	N903023-03			7094-003	U		U	
B0V0K6	N903023-04			7094-004	U		U	
B0V0K7	N903023-05			7094-005	0.059 U		U	
B0V0K8	N903023-06			7094-006	U		U	
B0V0K9	N903023-07			7094-007	U		U	
BLK (QC ID=30265)	N903023-09			7094-009	U		U	
LCS (QC ID=30264)	N903023-08			7094-008	ok		ok	
Duplicate (N903023-01)	N903023-10			7094-010	-	U	-	U

Nominal values and limits from method   RDLs (pCi/g)   0.050   0.050

109-N Roof Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-175		2σ prep error 5.0 %		Reference Lab		Notebook #2857 pg. 175										
B0V0K3	N903023-01			0.24	0.100			87		559			7	03/12/99	03/12	SS-010
B0V0K4	N903023-02			0.31	0.100			80		559			7	03/12/99	03/12	SS-011
B0V0K5	N903023-03			0.27	0.100			78		559			7	03/12/99	03/12	SS-012
B0V0K6	N903023-04			0.38	0.100			54		559			7	03/12/99	03/12	SS-013
B0V0K7	N903023-05			0.34	0.100			80		1057			7	03/12/99	03/12	SS-042
B0V0K8	N903023-06			0.30	0.100			71		559			7	03/12/99	03/12	SS-015
B0V0K9	N903023-07			0.33	0.100			63		559			7	03/12/99	03/12	SS-016
BLK (QC ID=30265)	N903023-09			0.050	1.00			48		561				03/12/99	03/12	SS-036
LCS (QC ID=30264)	N903023-08			0.044	1.00			55		561				03/12/99	03/12	SS-035
Duplicate (N903023-01) (QC ID=30266)	N903023-10			0.35	0.100			66		562			7	03/12/99	03/12	SS-059
Nominal values and limits from method				0.050	1.00			20-105	10	100			180			

Test <u>PU</u> Matrix <u>SOLID</u>

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0350</u>

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	<u>0.26</u>	±	<u>0.24</u>
FOR 10 SAMPLES	YIELD	<u>68</u>	±	<u>26</u>

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVL-CMS</u>

Version <u>3.0</u>

Report date <u>04/06/99</u>

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	1÷3	2σ	2÷3	2σ
Preparation batch 2857-175											
B0V0K3	N903023-01			7094-001	U	U	U				
B0V0K4	N903023-02			7094-002	0.397	U	0.552	72	35	3	6
B0V0K5	N903023-03			7094-003	U	U	U				
B0V0K6	N903023-04			7094-004	U	U	U				
B0V0K7	N903023-05			7094-005	0.127 J	U	U				
B0V0K8	N903023-06			7094-006	U	U	U				
B0V0K9	N903023-07			7094-007	U	U	U				
BLK (QC ID=30265)	N903023-09			7094-009	U	U	U				
LCS (QC ID=30264)	N903023-08			7094-008	ok	ok	ok				
Duplicate (N903023-01)	N903023-10			7094-010	- U	- U	- U				

Nominal values and limits from method			RDLs (pCi/g)		0.30	0.30	0.30	100		4	
109-N Roof Sampling								Averages 72		3	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-175		2σ prep error 5.0 %		Reference Lab		Notebook #2857 pg. 175										
B0V0K3	N903023-01			0.12	0.500			97		176			7	03/12/99	03/12	SS-003
B0V0K4	N903023-02			0.13	0.500			95		176			7	03/12/99	03/12	SS-005
B0V0K5	N903023-03			0.13	0.500			93		176			7	03/12/99	03/12	SS-006
B0V0K6	N903023-04			0.14	0.500			90		176			7	03/12/99	03/12	SS-007
B0V0K7	N903023-05			0.13	0.500			96		176			7	03/12/99	03/12	SS-008
B0V0K8	N903023-06			0.13	0.500			100		176			7	03/12/99	03/12	SS-009
B0V0K9	N903023-07			0.14	0.500			89		176			7	03/12/99	03/12	SS-010
BLK (QC ID=30265)	N903023-09			0.093	1.00			68		176				03/12/99	03/12	SS-012
LCS (QC ID=30264)	N903023-08			0.40	1.00			43		176				03/12/99	03/12	SS-011
Duplicate (N903023-01)	N903023-10			0.13	0.500			94		176			7	03/12/99	03/12	SS-013
(QC ID=30266)																

Nominal values and limits from method				0.30	1.00			30-105	150	100			180			

| Lab id TMANC |
| Protocol Hanford |
| Version Ver 1.0 |
| Form DVD-CMS |
| Version 3.06 |
| Report date 04/06/99 |

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD				
FOR 10 SAMPLES	MDA	<u>0.15</u>	±	<u>0.17</u>
	YIELD	<u>86</u>	±	<u>35</u>

Lab id	<u>TMANC</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-CMS</u>
Version	<u>3.06</u>
Report date	<u>04/06/99</u>

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 2857-175						
B0V0K3	N903023-01			7094-001	U	
B0V0K4	N903023-02			7094-002	U	
B0V0K5	N903023-03			7094-003	U	
B0V0K6	N903023-04			7094-004	U	
B0V0K7	N903023-05			7094-005	U	
B0V0K8	N903023-06			7094-006	U	
B0V0K9	N903023-07			7094-007	U	
BLK (QC ID=30265)	N903023-09			7094-009	U	
LCS (QC ID=30264)	N903023-08			7094-008	ok	
Duplicate (N903023-01)	N903023-10			7094-010	-	U

Nominal values and limits from method   RDLs (pCi/g)   1.0

109-N Roof Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-175	2σ prep error 10.0 %		Reference Lab	Notebook #2857 pg. 175												
B0V0K3	N903023-01			3.5	0.100			49		400			6	03/11/99	03/11	GRB-201
B0V0K4	N903023-02			4.3	0.100			36		400			6	03/11/99	03/11	GRB-202
B0V0K5	N903023-03			4.3	0.100			35		400			6	03/11/99	03/11	GRB-203
B0V0K6	N903023-04			3.5	0.100			47		400			6	03/11/99	03/11	GRB-204
B0V0K7	N903023-05			3.2	0.100			47		400			6	03/11/99	03/11	GRB-205
B0V0K8	N903023-06			4.5	0.100			38		400			6	03/11/99	03/11	GRB-206
B0V0K9	N903023-07			4.2	0.100			37		400			6	03/11/99	03/11	GRB-207
BLK (QC ID=30265)	N903023-09			0.31	1.00			54		400				03/11/99	03/11	GRB-229
LCS (QC ID=30264)	N903023-08			0.26	1.00			50		187				03/11/99	03/16	GRB-217
Duplicate (N903023-01) (QC ID=30266)	N903023-10			3.2	0.100			48		400			6	03/11/99	03/11	GRB-232

Nominal values and limits from method   1.0   1.00   100   180

Test <u>SR</u> Matrix <u>SOLID</u>

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0350</u>

PROCEDURES	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium
		Purification, rev 0

| AVERAGES ± 2 SD | MDA | <u>3.1</u> ± <u>3.1</u> |
| FOR 10 SAMPLES | YIELD | <u>44</u> ± <u>14</u> |

Lab id	<u>TMANC</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-CMS</u>
Version	<u>3.06</u>
Report date	<u>04/06/99</u>

Test GAM Matrix SOLID
SDG 7094
Contact L.A. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0350

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137	
Preparation batch 2857-175							
B0V0K3	N903023-01			7094-001	4.36	U	
B0V0K4	N903023-02			7094-002	10.1	U	
B0V0K5	N903023-03			7094-003	7.92	U	
B0V0K6	N903023-04			7094-004	U	U	
B0V0K7	N903023-05			7094-005	U	U	
B0V0K8	N903023-06			7094-006	U	U	
B0V0K9	N903023-07			7094-007	U	U	
BLK (QC ID=30265)	N903023-09			7094-009	U	U	
LCS (QC ID=30264)	N903023-08			7094-008	ok	ok	
Duplicate (N903023-01)	N903023-10			7094-010	ok	-	U

Nominal values and limits from method   RDLs (pCi/g)   0.050   0.050

109-N Roof Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2857-175	2σ prep error 15.0 %		Reference Lab	Notebook #2857 pg. 175												
B0V0K3	N903023-01			3.1	5.85					262			4	03/08/99	03/09	JR,01,00
B0V0K4	N903023-02			1.5	14.0					262			4	03/08/99	03/09	JR,03,00
B0V0K5	N903023-03			1.4	7.12					262			4	03/08/99	03/09	JR,04,00
B0V0K6	N903023-04			0.84	18.1					414			4	03/08/99	03/09	JR,01,00
B0V0K7	N903023-05			1.0	14.3					414			4	03/08/99	03/09	JR,03,00
B0V0K8	N903023-06			0.38	15.7					414			4	03/08/99	03/09	JR,04,00
B0V0K9	N903023-07			0.32	21.0					444			5	03/08/99	03/10	JR,04,00
BLK (QC ID=30265)	N903023-09			0.026	750					261				03/08/99	03/09	JR,07,00
LCS (QC ID=30264)	N903023-08			0.006	750					722				03/08/99	03/09	JR,04,00
Duplicate (N903023-01) (QC ID=30266)	N903023-10			1.3	6.99					722			4	03/08/99	03/09	JR,03,00

Nominal values and limits from method   0.050 750   100   180

METHOD SUMMARIES
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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 04/06/99

METHOD SUMMARY, cont.

GAMMA SCAN

GAMMA SPECTROSCOPY

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD		MDA	<u>0.99</u> ± <u>1.9</u>
FOR 10 SAMPLES		YIELD	_____ ± _____

Lab id	<u>TMANC</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-CMS</u>
Version	<u>3.06</u>
Report date	<u>04/06/99</u>

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0350</u>

S A M P L E   S U M M A R Y

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

*   LAB SAMPLE ID is the lab's primary identification for a sample.

*   DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

*   CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

*   QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

    QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

*   All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-RG</u>

Version <u>3.06</u>

Report date <u>04/06/99</u>

SDG 7094
Contact L.A. Johnson

R E P O R T   G U I D E

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0350

P R E P A R A T I O N   B A T C H   S U M M A R Y

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

   These qualifiers should be reviewed as follows:

   X   Some data has been manually entered or modified. Transcription errors are possible.

   P   One or more results are 'preliminary'. The data is not ready for final reporting.

   2   There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

   Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/06/99

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

R E P O R T   G U I D E

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0350</u>

W O R K   S U M M A R Y

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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Version <u>3.06</u>

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R E P O R T   G U I D E

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0350

D A T A   S H E E T

The Data Sheet Report shows all results and primary supporting
information for one client sample or Method Blank. This report
corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If
  the TEST is empty, no data is available; the analyte was not
  analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the
  Summary Data Section of a Data Package. The Work Summary and
  Method Summary Reports further identify raw data that underlies
  this work.

  The Method Summary Report for each TEST has method performance
  data, such as yield, for each Lab Sample ID and a list of
  procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a
  preparation (non-counting method) error has been added, as
  square root of sum of squares, to the counting error denoted by
  COUNT. The preparation errors, which may vary by preparation
  batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did
  this work but chooses not to report it now, possibly because it
  was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not
  Applicable). This means there is no reported client sample work
  in the same preparation batch as the Blank's result. This is
  likely to occur when the Method Blank is associated with
  reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

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T M A / R I C H M O N D

SAMPLE DELIVERY GROUP H0350

SDG <u>7094</u>	
Contact <u>L.A. Johnson</u>	

G U I D E , c o n t .

Client <u>Hanford</u>	
Contract <u>TRB-SBB-207925</u>	
Case no <u>SDG-H0350</u>	

D A T A   S H E E T

If the MDA is blank, the ERROR is used as the limit.

J   The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B   A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L   Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H   Similar to 'L' except the recovery was high.

P   The RESULT is 'preliminary'.

X   Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2   There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

*   An MDA is underlined if it is bigger than its RDL.

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T M A / R I C H M O N D

SAMPLE DELIVERY GROUP H0350

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

G U I D E ,   c o n t .

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D A T A   S H E E T

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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SDG 7094

Contact L.A. Johnson

REPORT GUIDE

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0350

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

Lab id TMANC

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Contact <u>L.A. Johnson</u>

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Case no <u>SDG-H0350</u>

D U P L I C A T E

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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Contact <u>L.A. Johnson</u>

G U I D E ,   c o n t .

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D U P L I C A T E

2. A protocol factor (typically 2) times the average MDA as
   a percent of the average result. This limit applies
   when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by
  the Difference Error Ratio (DER), which is the absolute value
  of the difference of the results divided by the quadratic sum of
  their one sigma errors, the same errors as used in the first
  limit.

  Except for differences due to rounding, the DER is the
  same as the RPD divided by the first RPD limit with the
  limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor,
  typically 2 or 3, shown in the header for the first RPD limit.

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Contact <u>L.A. Johnson</u>

R E P O R T   G U I D E

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0350</u>

M A T R I X   S P I K E

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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Contact <u>L.A. Johnson</u>

GUIDE, cont.

Client <u>Hanford</u>

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

*   The recovery is underlined (out of spec) if it is outside either of these ranges.

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R E P O R T   G U I D E

M E T H O D   S U M M A R Y

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0350

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

GUIDE, cont.

Client <u>Hanford</u>

Contract <u>TRB-SBB-207925</u>

Case no <u>SDG-H0350</u>

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0350

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

GUIDE, cont.

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METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1-3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0350

SDG <u>7094</u>

Contact <u>L.A. Johnson</u>

G U I D E ,   c o n t .

Client <u>Hanford</u>

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Case no <u>SDG-H0350</u>

M E T H O D   S U M M A R Y

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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| Collector R. Nielson/R. Fahlberg | Company Contact Nolan Draper | Telephone No. 373-7310 | Project Coordinator TRENT, SJ | Price Code | Data Turnaround |

usiness D

| Project Designation 109-N Roof Sampling | Sampling Location 100N | SAF No. B99-021 | | |

| Ice Chest No. 844 | Field Logbook No. EI-1381-I | Method of Shipment Federal Express |

| Shipped To TMA/RECRA | Offsite Property No. A990075 | Bill of Lading/Air Bill No. |

COA

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None										
	Type of Container	P										
	No. of Container(s)	1										
Special Handling and/or Storage	Volume	1000mL										

SAMPLE ANALYSIS — See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B0V0K3	Other Solid	3/5/99	0932	X									
B0V0K4	Other Solid	3/5/99	0950	X									
B0V0K5	Other Solid	3/5/99	1000	X									
B0V0K6	Other Solid	3/5/99	1015	X									
B0V0K7	Other Solid	3/5/99	1035	X									

CHAIN OF POSSESSION Sign/Print Names 1250

Relinquished By	Date/Time	Received By	Date/Time
Bill Nielson / Reree Nielson	3/5/99	Fed Ex	3-5-99
Fed Ex	3-6-99 12:00	R.Rorso JA Corso	3-6-99 12:00

SPECIAL INSTRUCTIONS

** All analyses done at TMA will be on a 3-Business Day turnaround, with the exception of Isotopic Uranium and Isotopic Plutonium which will be on a 7 day TAT.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Activity Scan

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

Collector R. Nielson/R. Fahlberg	**Company Contact** Nolan Draper	**Telephone No.** 373-7310

Project Coordinator TRENT, SJ	**Price Code**	**Data Turnaround** usiness D

Project Designation 109-N Roof Sampling	**Sampling Location** 100N	**SAF No.** B99-021

Ice Chest No. 844	**Field Logbook No.** EI-1381-1	**Method of Shipment** Federal Express

Shipped To TMA/RECRA	**Offsite Property No.** A990075	**Bill of Lading/Air Bill No.**

COA

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None
Type of Container	P
No. of Container(s)	1
Volume	1000mL

SAMPLE ANALYSIS

See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time												
B0V0K8	Other Solid	3-5-99	1040	X											
B0V0K9	Other Solid	3-5-99	1100	X											

CHAIN OF POSSESSION

Sign/Print Names 1250

Relinquished By	Date/Time 3/5/99	Received By	Date/Time
R. Nielson / R. Nielson		Fed Ex	3-5-99
Relinquished By Fed Ex	Date/Time 3-6-99 12:00	Received By JR Corso	Date/Time 12:00 3-6-99
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
** All analyses done at TMA will be on a 3-Business Day turnaround, with the exception of Isotopic Uranium and Isotopic Plutonium which will be on a 7 day TAT.

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Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: _Bechtel Hanford_ Date/Time received _3-6-99_ _1200_

CoC No. _B99-021-04_

Container I.D. No. _844_ Requested TAT (Days) _3&7_ P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]

2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]

3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]

4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]

5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]

6. Number of samples in shipping container: _7_

7. Number of containers per sample: _____ (Or see CoC _____)

8. Paperwork agrees with samples? Yes [✓] No [ ]

9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]

10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]

11. Describe any anomalies: _____
_____
_____
_____
_____
_____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____

14. Received by _Alonso_ Date: _3-6-99_ Time: _12:00_

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____